

SOIL SURVEY OF HALE COUNTY, ALABAMA.

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DESCRIPTION OF THE AREA.

Hale County, Ala., is located in the west-central part of the State. It is bounded on the north by Tuscaloosa County, on the east by Bibb and Perry counties, on the south by Marengo, and on the west by Greene and Sumter counties.

The county embraces an area of 654 square miles, or 418,560 acres. The topographic features of Hale County are varied and interesting, owing to the three pronounced physiographic divisions within its borders. First, the hilly uplands in the northern part, locally known as "sandy lands;" second, the prairie section in the southern part; and, third, the bottom land along the Black Warrior River in the western part. Between the first and second divisions and distinctly separating them is the Eutaw Escarpment, which runs in a northwest-southeast direction.

The first division north of Greensboro, and extending to the county line on the north, is very broken and hilly, being crossed by many streams and their tributaries, which run in a westerly direction.

The second division, or prairie section, which covers the entire southern part of the county, presents little variation of topography,

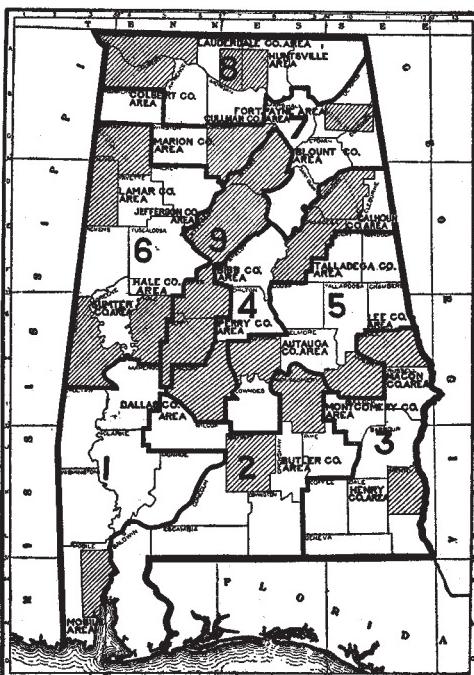


FIG. 24.—Sketch map showing location of the Hale County area, Alabama.

being level to gently rolling and here and there broken by slightly elevated ridges of "post-oak land."

The third division, or river bottom, occurs in the western part of the county along the Black Warrior River, extending east from the river and having a width varying from 1 mile to 7 miles. The general topography is flat to gently undulating, with a few low, swampy areas. For the most part the drainage of this division is poorly developed, especially in the northern part of the county, at Stewart, Cypress, and Powers.

The county as a whole is well drained, as the map shows. The many streams and their tributaries, which head in the extreme eastern part of the county, run in a westerly direction and empty into the Black Warrior River, which forms the county line between Hale and the adjoining counties of Sumter and Greene. This river empties into the Tombigbee River just south of the county line at Demopolis.

The largest and most important streams in the prairie section are Big and Little Prairie and Big German creeks, which with their tributaries afford good drainage to that section. Elliotts, Five Mile, and Big creeks are the important streams in the northern part, and with their tributaries afford good drainage for that section. These streams differ from those in the southern part of the county in that they occupy deeper and narrower valleys in the eastern part of the county where they head. The valleys gradually become wider toward the river and where they meet the flat river bottoms they form large semiswampy areas. During the high water these areas are overflowed for long periods of time.

In 1816 the first settlements in Hale County were made at what is now known as Greensboro. The pioneers came from Georgia, Tennessee, Kentucky, North Carolina, and South Carolina. They soon built up a small village, to which they gave the name of Troy, which name was retained until 1823, when it was changed to Greensboro. In 1819 Alabama was admitted into the Union. At that time all of the country north of Greensboro, where Havana, Moundville, and other small villages are now located, was an unbroken forest of primeval oak, hickory, chestnut, and pine. The southern part of the county was in the same condition. In 1819 Greene County was created from portions of Tuscaloosa and Marengo counties, of which Hale County was a part until 1869.

The early manner of travel was either on horseback or by stagecoach. The merchants riding to New York and other points to purchase their stock of goods shipped them to Mobile by boat, then to Cahaba, the former capital of the State in Marion County, and thence by wagon to Greensboro. This was the only way of obtaining supplies until 1870, when the first railroad was completed from Selma to Greensboro.

Greensboro, the county seat, with a population of about 2,500, is the largest town and is located near the center of the county. The remainder of the county is sparsely settled. Small villages with a population ranging from 50 to 300 are Newbern, Cedarville, Prairieville, Gallion, and Rosemary in the southern part, Phipps and Ingram in the northern part, and Sawyerville, Wedgworth, Akron, Stewart, Powers, and Moundville in the western part. The county is well supplied with transportation facilities. The Akron branch of the Southern Railway crosses the county from east to west, passing through Newbern, Greensboro, and Sawyerville, and connecting with the main line of the Alabama Great Southern at Akron, which traverses the county from north to south. This connection enables farmers to ship to any point, north, south, east, or west, while the Southern is on a direct line to Montgomery and other southern points. Another branch of the Southern crosses the county at Gallion, in the southwest corner, making connection at Marion Junction and with the Alabama Great Southern at York, Ala. The western part of the county along the Black Warrior River also has the opportunity to ship by a steamboat line running from Mobile to Tuscaloosa. The Government has recently installed a series of locks in the river, and this insures transportation throughout the year.

Greensboro is the principal cotton market of the county and has a large cotton-seed oil mill and cotton warehouse. Demopolis is the principal market for the southern part of the county and Moundville for the northern. At Akron there is a new cotton-seed oil mill which will handle the cotton seed formerly shipped from that section to Greensboro and other points.

The county roads in the northern part of the county are very poor, scarcely any attention being paid to them. There are deposits of gravel throughout this section, which, if properly applied, would make splendid roadbeds, and the highways could be put in excellent condition at a minimum cost. Most of the creeks have to be forded, and after heavy rains it is impossible to cross them for a week at a time. In the southern part, or prairie section, during the winter, the roads are almost impassable, but during the summer they are the best in the county.

Public schools and churches are numerous throughout the county. At Moundville a new state normal school has just been established, and at Greensboro is located the Southern University, one of the older educational institutions of the State.

CLIMATE.

The climatic conditions in the county are very favorable for general agriculture and make it possible to grow a variety of crops. The summers are long and warm, the growing season extending over a

period of about eight months. The winters are short and mild enough to allow the growing of forage crops for grazing. Snow is very seldom seen and only remains on the ground for a very short time. During the coldest months—December, January, February, and March—the average temperature is 48°, though at times it falls as low as 10° F. During the summer months—June, July, and August—the average is 79° F., the maximum reaching 100° to 105° for a few days at a time.

The precipitation is ample in most years for the growing of all crops, and is usually distributed over the growing season in such a way as to favor the development of the crops and their proper harvesting. The heaviest precipitation occurs from December to May, inclusive, the normal for the six months being 27.8 inches. Short periods of drought may, however, occur during the growing season. The average date of the last killing frost in the spring is March 20, and of the earliest in the fall about November 1.

The following table, compiled from the records of the Weather Bureau at Greensboro, shows the normal monthly and annual temperature and precipitation. The annual average precipitation, as shown, is 48.5 inches. In 1904 the precipitation was 35.67 inches, this being the lowest on record, and in 1900, 68.98 inches, the highest on record.

Normal monthly, seasonal, and annual temperature and precipitation at Greensboro.

| Month | Temperature. | | | Precipitation. | | | |
|----------------|--------------|-------------------|-------------------|----------------|-----------------------------------|------------------------------------|----------------------|
| | Mean. | Absolute maximum. | Absolute minimum. | Mean. | Total amount for the driest year. | Total amount for the wettest year. | Snow, average depth. |
| December..... | 49 | 75 | 10 | 4.8 | 2.2 | 2.2 | 0.3 |
| January..... | 45 | 78 | 12 | 5.2 | 5.4 | 4.4 | .2 |
| February..... | 50 | 79 | - 5 | 4.7 | 2.0 | 4.4 | 1.3 |
| Winter..... | 48 | | | 14.7 | 9.6 | 11.0 | 1.8 |
| March..... | 55 | 85 | 21 | 5.2 | 1.5 | 11.2 | .0 |
| April..... | 64 | 90 | 31 | 4.2 | 6.6 | 2.2 | .0 |
| May..... | 72 | 95 | 42 | 3.7 | .6 | 2.4 | .0 |
| Spring..... | 64 | | | 13.1 | 8.7 | 15.8 | .0 |
| June..... | 78 | 100 | 50 | 4.0 | 3.4 | 4.1 | .0 |
| July..... | 80 | 105 | 60 | 3.6 | 4.5 | 3.4 | .0 |
| August..... | 79 | 100 | 59 | 4.4 | 3.0 | 9.3 | .0 |
| Summer..... | 79 | | | 12.0 | 10.9 | 16.8 | .0 |
| September..... | 75 | 96 | 45 | 2.8 | 1.9 | 7.9 | .0 |
| October..... | 64 | 92 | 33 | 2.1 | .4 | 4.4 | .0 |
| November..... | 55 | 84 | 21 | 3.8 | 4.1 | 3.1 | Trace. |
| Fall..... | 65 | | | 8.7 | 6.4 | 15.4 | Trace. |
| Year..... | 64 | 105 | - 5 | 48.5 | 35.6 | 59.0 | 1.8 |

AGRICULTURE.

Hale County represents a well-established agricultural section of the State, farming having been carried on here for about ninety years. There are two distinct regions or belts in the county, known locally as the "sandy land region," comprising roughly the northern half of the county, and the prairie region, or limestone belt, comprising the southern half of the county.

Most of the early settlers, many of whom were slave-holders, located in the southern half, where the lands are more level and more easily cleared. Land being plentiful and cheap, they acquired large tracts and farmed on a large scale. Very few of the early settlers located in the northern half of the county, as it was heavily forested and the surface is rough and broken.

Almost from the first cotton has been the chief money crop, but in the early days corn, oats, wheat, rye, potatoes, etc., were grown in sufficient quantities for home consumption. The raising of farm animals, especially cattle and hogs, also received considerable attention. Sheep were raised mainly for their wool, which was used in the manufacture of homespun. An extensive rather than an intensive system of agriculture was the common practice, and little attention was paid to maintaining the fertility of the soil. Land was cheap and slave labor was plentiful, and it was cheaper to clear new land than to maintain the fertility of the old fields. Thus when the yields on the old fields began to decrease, they were abandoned and new tracts of land cleared. No commercial fertilizer was used. It became of general use about thirty years ago and now at least \$12,000 worth is used annually.

As already stated, cotton has been the chief money crop almost from the first, but after the civil war there was an increasing disposition to grow this crop, as it commanded a good price and a ready market. As the acreage of cotton increased, less attention was given to the many necessaries for home life and comparatively small quantities of the subsistence crops were grown. This system of farming is largely practiced to-day.

Through the prairie region the bulk of the land, while still held by white owners, is leased to negroes in small tracts, and this system has led most of the white people to move to the towns. Through the "sandy land region," on the other hand, the effect of the war on labor conditions is less noticeable. Most of the farming element consists of white people and only a few of the farms are tenanted.

Though cotton is still the all-important crop, diversified farming is beginning to be practiced to some extent. Trucking has been started in the western part of the county with good results. All varieties of vegetables produce abundantly and there is an unlimited

opportunity for the development of this industry. This is a new industry and a hearty cooperation of the railroads and shippers would easily solve the problem of rates, which at the present time is the great drawback.

Sugar cane is grown in the western and northern parts of the county and yields an excellent quality of sirup. Alfalfa has been introduced within the last few years with good results. This is a promising crop for the prairie region and is receiving more attention every year. Lespedeza, Melilotus, Johnson grass, and Bermuda grass also do well in this part of the county, and a few farmers are producing hay from these crops for market.

There are very few dairy farms in the county and not many beef cattle are sold, though no doubt both dairying and the raising of beef cattle would prove a profitable industry, especially on the Oktibbeha and Houston clay soils. One large cattle ranch on soils of this kind in the southern part of the county is proving very profitable and shows what can be done.

Very few orchards were seen, though fruit growing would no doubt prove profitable on the Orangeburg fine sandy loam and other soils in the northern part of the county.

According to the Twelfth Census the production of the different crops in 1899 was as follows: 93,643 acres were in cotton, producing 28,934 bales; 42,077 acres were in corn, producing 543,338 bushels; oats, 2,680 acres, producing 28,980 bushels, and 1,922 acres were in grasses for hay, producing 1,953 tons. The report also shows that potatoes, miscellaneous vegetables, sugar cane, and sorghum were also grown to some extent.

As shown by the report, the average yield of cotton is about one-third bale per acre and the average yield of corn about 13 bushels per acre. By proper methods of tillage and cultivation these yields could be greatly increased. The adaptation of soils to crops has been considered but very little by the farmers. Cotton is grown on the best land and corn and other crops on what is left.

At present no systematic rotation of crops is practiced, and this is one of the causes of the low yields on many of the types. Rotation is of great importance in keeping the soil productive and should be more extensively practiced. The following four-year rotation has been suggested and would no doubt be suitable to the conditions here: First year, cotton; second year, corn, and cowpeas at last plowing; third year, oats, and after these are cut cowpeas; fourth year, cotton again.

The cultural methods employed, except for some of the lighter types of soil in the western half of the county, are generally inadequate. The heavier clays and loam soils of the southern and western part of the county should be plowed deeper and be more thoroughly

pulverized. The essential thing is to get the soil well prepared to a good depth and then follow with shallow cultivation. If this were practiced the moisture conditions would be more favorable during the growing season of the crops, as the deep, loose seed bed would catch and retain the rainfall.

The greater part of the farm labor is drawn from the negro population. There is only a small supply of day laborers in the county. The majority of the negroes would rather rent a small farm than work for wages. Regular help costs from \$10 to \$12 a month and day labor from 50 to 75 cents a day. Cotton is picked at so much per hundred pounds.

A very small percentage of the farms in the southern and western parts of the county are operated by the owners. The most of these landholders live in Greensboro or some town outside the area. In the northern part of the county the farms are smaller, and most of them are operated by the owners. The common method of rental is to parcel the land out in "1 mule farms" of from 30 to 40 acres, for which the tenant pays one to two bales of cotton, depending on the fertility and location of the land. An "ox farm" consists of about 20 acres. A cash rental is sometimes paid for land, the rate ranging from \$1 to \$3 an acre. In most cases the tenant gives a mortgage on the prospective crop, for which the landowner furnishes him with provision for the year or stands security for them at the store.

The Census of 1900 reports 336,133 acres in farms, of which 174,725 acres are improved. The average size of the farms given is 88.3 acres, but each tenancy of 25 to 100 acres was classed as a farm, and thus the size of individual holdings is much greater than the figures reported. There are many small farms, while on the other hand farms of several thousand acres were seen.

The land values of the county are still comparatively low. The uplands range in price from \$10 to \$30 and the "prairie" soils from \$10 to \$50 an acre.

All the soils of Hale County are susceptible of improvement, and more attention should be paid to their permanent upbuilding. The most important requisites for accomplishing this are greater diversification and rotation of crops, deeper plowing and a better preparation of the seed bed, and the growing of leguminous crops. The raising of live stock and dairying would also aid in bettering the agricultural conditions. The prairie region could be developed into a good dairying section.

The raising of hogs, mules, and horses would also prove a profitable industry on these soils.

The Orangeburg fine sandy loam, which is the most important type in the northern part of the county, is a good peach soil, and no doubt the peach industry would prove very profitable on this type.

In the vicinity of Havana, on the Greenville loam, and at other places in this part of the county where this type occurs, there is an opportunity to grow cigar filler tobacco of the Cuban variety. This tobacco is now being grown successfully on similar soil in the adjoining counties of Perry and Dallas.

All of the bottom lands when properly drained will give heavy yields of corn and grass.

The Houston clay and Trinity clay when well drained are excellent for alfalfa. Johnson grass does well on all productive soils.

SOILS.^a

Hale County lies wholly within what is known as the Coastal Plain. The chief formations are the Tuscaloosa, Eutaw, Selma chalk, and Lafayette. All belong to the Cretaceous period, except the Lafayette, which is post-Tertiary.

The Tuscaloosa clays occur in the northeastern quarter, the Eutaw sands occupy the middle section overlapping the Tuscaloosa, and the Selma chalk, or Rotten limestone, is found in the southern part. Of the alluvial soils the first bottoms are of recent origin, while it is thought the second bottom dates back to Pleistocene or post-Tertiary age. The third and highest terrace left by the Black Warrior River comprises the belt on which Moundville, Powers, Stewart, Akron, and Wedgworth are located, and it probably was built up at the close of the Pleistocene age, which gave rise to the Lafayette mantle. In appearance it is very much the same as the Lafayette formation.

The stream valleys of the entire county are all of recent origin, being alluvial soils formed from the washings of the sands and clays of the uplands. The section north of the prairie region is covered with a mantle of the Lafayette formation. In the northeastern part the Tuscaloosa clays are well exposed where erosion has taken place along the roads and slopes leading down to the streams. The Tuscaloosa clays are easily recognized, both by their peculiar massive appearance and generally also by their color, which is variegated with shades of purple, gray, brown, and white, as well as by the fact that where they outcrop along the roads there is necessity for laying causeways in order to render the roads passable. About 2 miles south of Havana there are several deep gullies where the strata of the Tuscaloosa sands and clays are exposed. Between Havana and Greensboro the Eutaw overlaps the Tuscaloosa. The former consists of yellowish-red cross-bedded sands, with thin partings of gray clay and knolls of gravel. Where this occurs the topography is rolling and broken and the soil has a peculiar yellowish-red color.

^a In the descriptions of geological formations given in this chapter use has been made of the information given in the Geology of the Coastal Plain of Alabama (1894) by Dr. E. A. Smith.

Greensboro is situated upon the dividing line between the Eutaw sand and Selma chalk, or Rotten limestone, giving rise to the sandy post-oak lands which are formed by the Eutaw sands overlapping the Selma chalk.

In the lower part of the county, not far from Prairievile, a ridge with an elevation of 60 to 70 feet and consisting of almost pure limestone, crosses the county from east to west. This rock is often burned for lime, for which purpose it answers well.

In all fifteen different types of soil were recognized in the county. The following table gives the name and area of the several types mapped:

Areas of different soils.

| Soil. | Acres. | Per cent | Soil. | Acres. | Per cent. |
|------------------------------|--------|----------|--|---------|-----------|
| Orangeburg fine sandy loam.. | 86,592 | 20.7 | Greenville loam | 11,392 | 2.7 |
| Houston clay..... | 55,104 | 13.2 | Oktibbeha fine sandy loam... | 11,008 | 2.6 |
| Ocklocknee fine sandy loam.. | 53,952 | 12.9 | Orangeburg sandy loam..... | 10,880 | 2.6 |
| Waverly clay loam..... | 37,056 | 8.8 | Cahaba fine sandy loam..... | 7,552 | 1.8 |
| Oktibbeha clay..... | 33,152 | 7.9 | Orangeburg gravelly sandy loam..... | 6,592 | 1.6 |
| Cahaba loam..... | 27,840 | 6.7 | Norfolk fine sandy loam..... | 3,328 | .8 |
| Trinity clay..... | 27,456 | 6.6 | Total..... | 418,560 | ----- |
| Susquehanna gravelly loam.. | 24,384 | 5.8 | | | |
| Guin fine sandy loam..... | 22,272 | 5.3 | | | |

HOUSTON CLAY.

The Houston clay of this area consists of 6 to 15 inches of gray to black calcareous silty clay, underlain by a gray to yellowish chalky silty clay. Owing to erosion light-gray areas occur in many places where the soil is little different from the subsoil; in many instances there are outcrops of the rotten limestone. From this extreme there are many intermediate variations both in color and depth of the soil to the very black soil with a depth of 15 inches. Varying quantities of lime concretions are intermixed with the soil and scattered over the surface, and in some places the surface is strewn with shells. The soil is sticky and plastic when wet, but when only moist it is soft and friable and easily put in good tilth.

The Houston clay occurs in the southern part of Hale County, the areas lying south of the Eutaw escarpment. It is associated with knolls and ridges of post-oak land composed of types of the Oktibbeha series, almost the entire area being intersected by belts of this soil which vary in width from 1 to 4 miles and which cross the area in a northerly and southerly direction.

The Houston clay is derived from the weathering of rotten limestone, the Selma chalk formation. This limestone in an unweathered state underlies all of this type at various depths below 3 feet. The surface of the type varies from flat to slightly hilly, and with the

exception of occasional depressions where the drainage outlets are insufficient, it is naturally well drained.

The original timber growth of this type was oak, hickory, cedar, hawthorn, wild plum, ash, and some other deciduous species.

Nearly all of the Houston clay is under cultivation. Though clodding badly when plowed too wet, it is a very strong and productive soil, and is especially adapted to forage crops and the raising of live stock. Johnson grass yields well and brings from \$8 to \$14 a ton. Bermuda grass and Melilotus grow luxuriantly and afford good grazing for cattle. A few have tried alfalfa and find that it does exceptionally well when given the proper care. A good sod of alfalfa yields from one-half ton to 1 ton to the acre at each cutting and gives from three to four cuttings during the season. Cotton and corn are the principal crops grown at present. Cotton yields from one-half bale to 1 bale, corn 20 to 50 bushels, and oats 20 to 60 bushels per acre.

The value of the Houston clay lands ranges from \$10 to \$50 an acre, and a yearly rental of \$3 to \$4 an acre is generally obtained when the land is leased.

The average results of mechanical analyses of samples of the Houston clay are given in the following table:

Mechanical analyses of Houston clay.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21234, 21236..... | Soil..... | 0.3 | 0.9 | 1.6 | 9.0 | 8.3 | 50.2 | 28.9 |
| 21235, 21237..... | Subsoil..... | 1.8 | 1.9 | .9 | 5.3 | 4.5 | 45.1 | 40.7 |

OKTIBBEHA CLAY.

The Oktibbeha clay, locally known as "post-oak land," consists of 4 to 8 inches of brown to reddish silty clay, underlain by a very sticky brownish clay generally mottled with red, yellow, and gray. Some areas of rather red soil and subsoil, locally known as "red prairie post-oak land," occur, but it was deemed advisable to include them in this type. The subsoil becomes more mottled with depth and below 3 feet the gray color becomes more pronounced. This soil is very plastic when wet, but on drying becomes hard and at certain moisture stages is very tough and sticky. The type is everywhere underlain at varying depths by decaying white limestone, which in some small areas is within 2 or 3 feet of the surface.

The Oktibbeha clay occurs in the prairie region south of Greensboro, forming several narrow belts which run south almost to the county line and which vary in width from 1 to 3 miles. Several

large areas occur in the southeastern part of the county around and south of the town of Newbern, and detached areas also occur here and there. Almost all the areas are intersected by small stream valleys and the surface ranges from gently rolling to hilly. The more level areas usually have the brown and yellow subsoil and most of them a grayish-brown silty surface soil 3 or 4 inches deep.

The Oktibbeha clay is probably derived from an admixture of the heavy clay of the Selma chalk formation with unconsolidated sediments of later age. The original tree growth consists of Spanish, post, and red oak and shortleaf pine. Very little of the Oktibbeha clay is as yet under cultivation and much of it is still covered with the native forest growth. Cotton and corn are the principal crops grown on this type and when the seasons are favorable give fairly good yields. Cotton yields from one-half bale to 1 bale and corn from 10 to 30 bushels per acre.

Owing to the close structure of the soil and its lack of humus, a larger part of the rainfall runs off the surface. Deep plowing and the addition of vegetable matter would tend to correct this. When the soil has been built up in this way it should be seeded down to grasses for pasture. Bermuda grass would prove excellent for this purpose. Melilotus and Johnson grass do well on this type.

The Oktibbeha clay affords good opportunities for dairy farming and stock raising.

The following table gives the average result of mechanical analyses of the soil and subsoil:

Mechanical analyses of Oktibbeha clay.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21274, 21276..... | Soil..... | 0.4 | 1.2 | 1.9 | 15.9 | 2.7 | 47.5 | 30.2 |
| 21275, 21277..... | Subsoil..... | .3 | 1.2 | 1.6 | 7.8 | 1.7 | 35.7 | 51.4 |

OKTIBBEHA FINE SANDY LOAM.

The Oktibbeha fine sandy loam usually consists of 6 to 10 inches of brownish-gray to light-brown fine sandy to silty loam grading into a mottled gray silty clay to heavy clay subsoil. In some localities, however, the subsoil is red. The type is a gradation between some of the more sandy soils and the adjacent Oktibbeha clay and differs from the latter in being lighter textured and easier to cultivate. The Oktibbeha fine sandy loam occurs in broken bands between the Oktibbeha clay and some of the sandy soils and the Houston clay. The surface of this type is more rolling than the Oktibbeha clay and for this reason is naturally better drained.

The Oktibbeha fine sandy loam is derived from a mixture of the silts, sands, and clays of the Lafayette formation and the underlying Selma chalk, and does not differ greatly from the Oktibbeha clay in mineral constituents.

Very little of this type is in cultivation, as it ranks low in agricultural value in the estimation of the farmers. It is deficient in lime and would be much improved also by the addition of vegetable matter in the form of barnyard manure or leguminous crops plowed under. When the seasons are favorable cotton yields from one-fourth to one-half bale and corn 12 to 15 bushels per acre. Grasses and leguminous and other forage crops yield fairly well.

This type ranges in value from \$5 to \$10 an acre.

The following table gives the average results of the mechanical analyses of the soil and subsoil:

Mechanical analyses of Oktibbeha fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21270, 21272..... | Soil..... | 0.3 | 1.2 | 4.7 | 42.4 | 9.1 | 31.3 | 10.2 |
| 21271, 21273..... | Subsoil..... | .1 | .8 | 2.7 | 23.4 | 4.4 | 30.5 | 37.7 |

TRINITY CLAY.

The Trinity clay consists of 6 to 10 inches of brown to brownish-gray silty clay, underlain with a mottled brownish-gray to drab clay subsoil. The soil is very sticky and plastic when wet, but when dry it cracks and crumbles. It contains an abundance of organic matter and is very retentive of moisture. If kept mulched it will retain moisture within a few inches of the surface during prolonged droughts. If plowed too wet it clods badly and the cloddy structure remains throughout the season, but if handled at the proper moisture stage it has a coarse granular structure which is not destroyed by rains.

The Trinity clay is formed by its wash from the heavy silty and clayey materials of the Houston clay and Oktibbeha clay types. These bottoms vary in width from one-eighth to 1 mile, depending on the size of the streams along which they are found. All of the bottoms occupied by this type are subject to occasional overflows, though naturally fairly well drained.

Over a part of this type there is still a natural forest growth of native varieties of oak, hickory, sweet gum, and other deciduous trees.

The Trinity clay is a very valuable agricultural soil and the greater part of it is under cultivation. Cotton and corn are the principal crops. Cotton yields from one-half bale to 1 bale and corn from 25

to 50 bushels per acre without fertilizer. Cotton fruits thinly on this soil, but owing to the larger growth of the stalk the yield is usually satisfactory. When well drained it is an excellent soil for alfalfa and the yield is from 3 to 5 tons per acre.

Both Bermuda and Johnson grass give heavy yields. It is thus seen to be an excellent soil for forage and pasture grasses.

From \$10 to \$50 an acre is the general range in price of land of this character, the difference depending mainly on location.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Trinity clay.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21258, 21262..... | Soil..... | 0.0 | 0.5 | 1.4 | 16.6 | 3.3 | 38.5 | 39.7 |
| 21259, 21263..... | Subsoil..... | .1 | .2 | .9 | 15.6 | 2.6 | 36.7 | 43.5 |

OCKLOCKNEE FINE SANDY LOAM

The Ocklocknee fine sandy loam is a bottom-land type found along the streams in the sandy region of Hale County. Owing to its origin and position the soil is somewhat variable.

The predominating phase, however, consists of a grayish fine sand to a brown fine sandy loam varying in depth from 8 to 15 inches, with an average depth of 10 inches. It is underlain with a mottled reddish and gray sandy to silty clay subsoil, becoming more tenacious with increase in depth. Along the small streams the soil is quite sandy, while along the larger streams it is more loamy. The largest areas are found bordering Elliotts, Five Mile, and Big creeks, with smaller areas developed near all of their tributaries. Along the larger streams the bottom is from one-fourth to 1 mile or more in width, the surface is usually quite level, and overflows frequent. Here the drainage is so poor that the land can not be depended on to make a crop and a few places are semiswampy the year round. The conditions along the smaller streams are more favorable to agriculture; the areas slope slightly toward the streams, the drainage is good, and much of the soil is under cultivation.

This is an alluvial soil of recent origin composed of the particles of sand and clay washed from the uplands, carried into the streams and by them deposited along their flood plains.

A large percentage of this type is still covered by a native growth of sweet gum, poplar, elm, ash, shortleaf and loblolly pine, and a heavy growth of underbrush.

This type seems to be better adapted to corn than to cotton. Corn yields 15 to 20 bushels per acre; cotton is grown to a small extent yielding one-fourth to one-third bale to the acre. On account of the wet condition of the soil along the larger streams areas have been abandoned after clearing as unfit for cultivation. Here a native growth of broom sedge has sprung up which is utilized by most of the farmers for grazing.

Cultivated areas of this type of soil have a value of \$4 to \$7 an acre, according to the character of improvements. The remainder is valued solely for the timber, and ranges in price from \$5 to \$10 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Ocklocknee fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|---------------|--------------|--------------|-------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21222, 21224..... | Soil..... | 0.0 | 1.3 | 4.6 | 53.4 | 11.5 | 21.8 | 7.1 |
| 21223, 21225..... | Subsoil | .1 | .8 | 4.5 | 45.9 | 7.6 | 20.8 | 19.9 |

SUSQUEHANNA GRAVELLY LOAM.

The Susquehanna gravelly loam consists of 4 to 8 inches of grayish sand to medium sandy loam, resting upon a red sandy loam subsoil. This is the prevailing type in the northwestern part of the county. It is closely associated with both the Orangeburg sandy loam and the Orangeburg fine sandy loam.

The general topography is very rough and broken, the soil occupying a range of steep hills, intersected by narrow crooked ravines. Most of the crests and slopes are literally covered with ferruginous sand-stone fragments, varying from small angular pieces to medium-sized boulders. Small iron concretions, water-rounded gravel, and irregular shaped cherty fragments are also strewn over the surface. The soil along these ravines is of a slightly more loamy structure and a little darker in color than the typical soil, while the subsoil varies in color from a red to yellowish red, in some places becoming slightly mottled and containing a small percentage of finely divided mica, at a depth of 30 to 40 inches. This phase is found east of Havana, in which vicinity the surfaces of some of the ridges are less encumbered with stones.

The Susquehanna gravelly loam is derived both from the Lafayette formation, which is the superficial formation in this section, and from the underlying Tuscaloosa clays.

Practically all the areas of this type are covered with a virgin growth of longleaf pine and black-jack oak. In the ravines there

is also a scattering growth of hickory and gum, with dogwood, sourwood, and scrub oak as the larger undergrowth. In some places where the timber has been cut off a growth of scrub oak has sprung up so thick that the usual vegetation disappears, leaving the land valueless for grazing. Along the tributaries of Elliotts and Five Mile creeks, which head in this area, there is a small amount of farming carried on, while farther back the hillsides are utilized for grazing cattle, sheep, and goats. This land at present has no value for agriculture. It is held chiefly for the timber, which is worth from \$5 to \$10 an acre.

The raising of cattle, sheep, and goats can be carried on profitably on account of the good grazing the hillsides afford.

CAHABA LOAM.

The Cahaba loam consists of from 4 to 8 inches of yellowish-gray to slightly reddish-yellow silty loam, underlain to 28 inches by a yellowish silty clay subsoil, becoming at 36 inches a mottled yellow and gray tenacious clay. Areas of the Cahaba loam occur as first high bottom land along the Black Warrior River. The general topography is level, although occasional slightly rolling areas are found. The largest areas lie north of Drakes Landing and Millwood, while smaller areas occur along the Black Warrior River, north to the Tuscaloosa County line. The best developed area lies west of Moundville, extending 3 or 4 miles back from the river and into Tuscaloosa County. This area is from 30 to 50 feet above the river and overflows only at rare intervals, while farther south it lies from 15 to 30 feet and is subject to overflow almost every spring.

The Cahaba loam is an alluvial soil formed by the silt and clay deposited by the flood waters of the Black Warrior River. Each overflow leaves a layer of sediment on the surface which adds to the fertility of the soil to such an extent that no fertilizers are used in growing the crops. Most of the higher areas, which are only subject to occasional overflow, are in cultivation. This is especially true in the northern part, where the terrace is best developed. Practically all of the areas farther south are covered with a forest growth of shortleaf pine, oak, ash, gum, hickory, elm, with an undergrowth of dogwood in the lower parts. This type seems to be especially adapted to the raising of corn, as it yields from 25 to 40 bushels per acre without fertilization. Where cotton is grown one-half to three-fourths bale is produced. Ribbon cane is grown on a large scale for commercial purposes; the average yield is about 250 gallons of sirup per acre. Where the land has been cleared and not cultivated Johnson grass takes possession, affording fine grazing. On account of its low-lying position it is only cultivated by colored farmers, and this accounts for the small percentage under plow at present. The timber land

is valued at \$10 to \$15 an acre. West of Moundville the cleared land brings as much as \$25, while farther south \$4 to \$8 an acre is the ordinary selling price.

The following table gives the average results of mechanical analyses of the soil and subsoil:

Mechanical analyses of Cahaba loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21286, 21288..... | Soil..... | 0.3 | 3.9 | 6.1 | 16.4 | 11.0 | 45.2 | 17.2 |
| 21287, 21289..... | Subsoil..... | .1 | 1.5 | 2.8 | 6.9 | 11.1 | 42.4 | 35.1 |

WAVERLY CLAY LOAM.

The Waverly clay loam, locally known as "swamp," like the preceding type, is first bottom land; but as it lies at a less elevation above the Black Warrior River, it is more subject to overflow, and it was deemed advisable to recognize it as a separate type.

The Waverly clay loam consists of 4 to 6 inches of gray to dark-gray clay loam, underlain by a mottled brown to gray clay, becoming more tenacious with increase in depth. In some places both soil and subsoil are of a brown color, owing to the larger percentage of organic matter it contains.

This type is more extensive than the Cahaba loam, with which it is closely associated. It occupies the lower first bottom along the Black Warrior River from the Tuscaloosa County line south to Arcola. The largest area lies west of Moundville, where the bottoms are several miles wide.

The surface being low and flat, the type is poorly drained. West of Cypress there are areas which are covered with water nearly the year round, while to the north several small lakes occur. All the area is more or less cut with deep sloughs and streams.

Owing to its mode of origin—the intermixture of the sands and clays and vegetable matter left from the flood water of the river and sediment from the creeks—the type is well supplied with the organic and mineral elements of fertility, and these are being added to from season to season. Scarcely any of this type is cultivated and nearly all of it is covered with forest. Where it is cultivated late corn, planted after the spring floods have subsided, is the only crop. The yield is from 30 to 40 bushels per acre. The forest growth consists of water oak, gum, birch, elm, hickory, and a heavy undergrowth of dogwood, bamboo cane, and other shrubs.

At present this type has little agricultural value. It is chiefly valued for its timber, which brings from \$7 to \$10 an acre. The

greater part is owned by lumber companies. In some sections it is used as pasture for hogs and cattle.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Waverly clay loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21278, 21280..... | Soil..... | 0.1 | 2.9 | 3.7 | 10.4 | 5.7 | 44.4 | 33.0 |
| 21279, 21281..... | Subsoil..... | .3 | .7 | 1.8 | 8.3 | 3.1 | 46.4 | 38.9 |

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam consists of 8 to 15 inches of grayish to brownish fine sandy loam, with an average depth of 8 inches, underlain by a reddish-yellow sandy to silty clay to 36 inches, becoming slightly mottled with increase in depth. On the slightly higher elevations the texture of the surface soil is inclined to be more sandy, while the lower portions are somewhat more loamy.

This type occurs mainly as a second terrace along the Black Warrior River. The area varies in width from one-fourth mile to 2 miles and in length from one-half mile to 4 miles, and is bounded on one side by the upland escarpment and on the other side by the lower lying bottoms.

At Evans there occurs a reddish phase of this soil which has a reddish-brown silty clay subsoil, becoming a bright red with increase of depth. The extent of such soil was, however, not sufficient to warrant classifying it as a separate soil.

The Cahaba fine sandy loam is found at Evans, Stewart, Powers, and Moundville, in the northern part of the county. The general topography is level to gently rolling, but by reason of the texture of its soil and subsoil even the level areas are well drained, making it one of the most valuable farming soils in the county. Practically all of it is under cultivation. On account of its position and structure it is adapted to a greater variety of crops than any of the other river soils.

This type is an alluvial soil derived from the intermixture of the sands and clays of the uplands with those of the flood waters of the river. Cotton and corn are the two principal crops. Cotton usually yields one-third to one-half bale per acre and with proper fertilization 1 bale to the acre. Corn yields 12 to 18 bushels per acre. This type is especially adapted to the growing of early Irish potatoes, melons, cabbage, onions, and other truck crops. Sugar cane and sweet potatoes do well. Oats are grown to a small extent and yield 25 to 30

bushels per acre. Cowpeas, bur clover, and Johnson grass can be successfully grown and besides yielding profitable crops, increase the organic matter content of the soil and improve it for subsequent crops. Fruits, such as peaches, plums, pears, and figs, do well on this type.

The forest growth once covering this type consisted of shortleaf pine, with a scattering growth of oak, hickory, and elm. Now most of this has been removed, and the land is valued at \$20 to \$75 an acre, according to location. In the vicinity of Moundville and Powers some of it is held as high as \$100 an acre, but farther south, where it is not so well developed, it ranges in price from \$20 to \$40 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil.

Mechanical analyses of Cahaba fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay |
|-------------------|--------------|-----------------|-----------------|-----------------|---------------|--------------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21282, 21284..... | Soil..... | 0.2 | 3.3 | 9.0 | 39.7 | 17.4 | 25.1 | 5.5 |
| 21283, 21285..... | Subsoil..... | 1 | 2.2 | 5.1 | 25.8 | 12.6 | 31.3 | 22.5 |

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of 4 inches of light-gray fine sandy loam resting on a brownish-yellow material of about the same texture though slightly heavier. This extends to 14 inches, where occurs a brownish-yellow sandy clay subsoil. Below 24 inches the color changes to a brighter yellow and the texture becomes more tenacious with increase in depth to 36 inches, the depth of boring.

There are only a few small areas of this type in the county. The largest lies 1 mile north of Sawyerville, and others are situated north and east of Greensboro.

The Norfolk fine sandy loam occupies flat to gently rolling areas. The natural drainage is good, owing to topography and the sandy texture of the soil. On the level areas the soil is slightly more loamy than on those of gently sloping surface.

The Norfolk fine sandy loam is derived from the Lafayette, which is the superficial formation in the section of the county in which this type of soil is developed.

On account of the sandy character of the soil, which makes it easy to cultivate, and because of its warm, early nature, practically all of this type is under cultivation.

It is adapted to the growing of cotton and corn and to sweet potatoes, peanuts, melons, Irish potatoes, cabbage, and other truck crops.

Sweet potatoes do well, yielding on the average 125 bushels per acre. The type is also well adapted to the growing of sugar cane, which though giving lighter yields than some of the heavier types, produces a sirup of brighter color and finer flavor. Cotton and corn are the two principal crops. Cotton yields from one-fourth to one-third bale and corn 8 to 12 bushels per acre. The surface soil is deficient in humus, which can be supplied by a systematic rotation of crops and the growing of cowpeas, vetch, bur clover, and peanuts. Cowpeas, vetch, and oats make good forage crops when harvested at the proper time. Oats yield 20 to 25 bushels per acre. This type was once covered with a growth of longleaf pine, very little of which is now left. Where it has been cut over shortleaf pine has sprung up, with a scattering of poplar and gum along the streams and an undergrowth of scrub oak and dogwood.

The land under cultivation is valued at \$10 an acre, while uncleared areas can be purchased for \$4 to \$7 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil of the Norfolk fine sandy loam.

Mechanical analyses of Norfolk fine sandy loam.

| Number. | Description | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|-----------------|-----------------|-----------------|---------------|--------------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21240, 21242..... | Soil..... | 0.1 | 0.8 | 4.8 | 59.9 | 8.9 | 19.1 | 5.9 |
| 21241, 21243..... | Subsoil..... | .1 | .7 | 5.4 | 48.3 | 6.4 | 27.6 | 11.7 |

GREENVILLE LOAM.

The Greenville loam, locally known as "red tablelands," consists of 4 to 8 inches of reddish loam to slightly sandy loam, underlain by a red sandy clay subsoil, which extends to a depth of several feet. The depth and character of the soil varies somewhat with the topography, becoming shallower and containing more silt in the level areas, while on the slight elevations the sand content increases slightly.

The largest bodies of Greenville loam occur around Havana, occupying a strip 3 or 4 miles in width which runs for a few miles in a northwesterly direction toward Moundville and a few miles south toward Akron. The area is level to gently rolling. The drainage for the most part is good and the topography is not rolling enough to cause erosion.

The Greenville loam is sedimentary in origin, being derived from the Lafayette sands and clays. The original timber growth was post, white, and red oak, shortleaf pine, and hickory. This is one of the most productive soils of the county. It is adapted to a great

variety of crops and practically all of it is under cultivation. Cotton and corn are the principal crops. Cotton does well, the yield usually ranging from one-half to three-fourths bale per acre, and when well fertilized and carefully cultivated 1 bale per acre is frequently secured. The type seems better adapted to this crop than to corn, which yields 15 to 20 bushels per acre. Oats, the principal winter crop, yields from 30 to 40 bushels per acre. The oat fields are used for winter pasture to some extent, the grain being sown in October or November. A rust-proof variety is used. When planted for the grain, the land is sowed in February and the crop harvested in June. Other winter cover crops are vetch and the clovers, while cowpeas are valuable as a catch crop.

It is not as early a soil as some of the more sandy types, but is more productive, its loamy nature giving it a better water-retaining capacity, while the more level topography prevents erosion and allows the use of modern machinery.

The productivity of this soil could be increased by systematic crop rotation, and the more general use of cover crops, thus increasing the humus in the soil, which is generally deficient. Sweet potatoes and ribbon cane are grown to a small extent, both of them yielding well. This type also seems adapted to the growing of tobacco, especially the Cuban filler variety, which is being successfully produced in the adjoining counties of Perry and Dallas.

This type is considered the most valuable farming land in the county and is valued at \$35 to \$75 an acre, the difference in price depending on the location and improvements. The greater percentage of this type is owned by a few planters who lease it to tenants.

The following table gives the average results of mechanical analyses of samples of the soil and subsoil:

Mechanical analyses of Greenville loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21226, 21228..... | Soil..... | 0.1 | 5.2 | 12.5 | 21.7 | 7.5 | 39.0 | 13.5 |
| 21227, 21229..... | Subsoil..... | .2 | 4.9 | 10.7 | 17.0 | 4.6 | 30.4 | 32.0 |

GUIN FINE SANDY LOAM.

The Guin fine sandy loam, locally called "sandy land," consists of a grayish fine sand to fine sandy loam, varying in depth from 15 to 30 inches, with an average depth of 20 inches. It is underlain by a red sandy to silty clay subsoil extending to 36 inches or more. In local areas the color of the subsoil may vary from a yellowish red to a deep red, but everywhere the predominating tint is red. The areas containing the largest percentage of sand in the subsoil are confined to

the rough, hilly sections. In the rolling areas the surface soil is slightly more loamy and the subsoil is somewhat more silty. While variations occur throughout this type, it is as a whole fairly uniform.

The largest area of this type lies east of Greensboro. Other areas occur north and southeast of Sawyerville and a few small areas in the northern part of the county.

The surface varies from broken to hilly, intersected in places by narrow ravines. There are nearly level to gently rolling areas, but they are of very limited extent. The roughest topography is found east of Greensboro, where many of the slopes are too steep and broken for cultivation. North of Sawyerville the surface is less broken and some of the slopes are under cultivation.

On account of the uneven topography and sandy nature of the soil the natural drainage is excellent, but the steep slopes and even the more gentle slopes are subjected to erosion, and the subsoil is exposed especially on the steeper slopes.

The Guin fine sandy loam is derived from the materials of the Lafayette and Eutaw formations, the former overlying the latter. The greater part of this type supports a forest growth of shortleaf pine, with a scattering of oak. On most of the areas the growth is rather sparse. On cut-over areas black-jack and scrub oak spring up.

Cultivation of this soil is easy, owing to its sandy friable texture. At the same time the subsoil is retentive of moisture and crops withstand drought well. Cotton is the principal crop, but the yield is very light, only one-fourth bale to the acre. Corn yields 8 to 12 bushels, with an average of about 10 bushels per acre. Early vegetables and melons do well, as do also peaches and plums. The productiveness of this soil could be greatly increased by systematic crop rotation, including such crops as oats, vetch, bur clover, and cowpeas, to increase the content of humus, which at the present time is low. Terracing should also be practiced to a greater extent to prevent the surface soil from washing away.

This type on account of its topography and sandy nature has a very low agricultural value—from \$2 to \$4 an acre. Prices are higher where the timber still stands, such areas bringing from \$8 to \$10 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of the Guin fine sandy loam:

Mechanical analyses of Guin fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21230..... | Soil..... | 0.0 | 0.8 | 6.9 | 58.4 | 8.7 | 19.2 | 6.0 |
| 21231..... | Subsoil..... | .0 | .5 | 3.5 | 29.4 | 11.7 | 11.8 | 42.9 |

ORANGEBURG FINE SANDY LOAM.

The soil of the Orangeburg fine sandy loam consists of a gray to reddish-brown fine sand to fine sandy loam 8 to 15 inches deep, with an average depth of 10 inches. It is underlain by a red sandy clay subsoil extending to 36 inches and becoming slightly silty and more tenacious with increase in depth. The surface soil where the land has been cleared and in cultivation is gray to light gray in color, while in the uncleared lands it has a brown to reddish-brown color. This difference is due to the larger amount of organic matter found in the virgin areas. A scattering of small iron concretions is present in the surface soil in some sections.

The Orangeburg fine sandy loam is the most extensive type of the uplands or "sandy-land" section and occupies about 30 per cent of area of the county. It occurs north of the Eutaw escarpment, which crosses the county just south of Greensboro, and in broken areas it extends north to the county line. The topography is rolling to hilly and broken, although some small areas are only undulating. The entire area is intersected by many small streams. On the steeper slopes much of the surface soil has been removed by erosion, exposing the underlying red clay. This condition is noticeable in many of the cultivated fields. On the other hand, on the lower slopes the sand has accumulated to a depth of 15 to 18 inches. The excellent natural drainage is due both to topographic position and character of soil and subsoil.

In origin the Orangeburg fine sandy loam is sedimentary, being derived through weathering from materials of the Lafayette formation. It is underlain by the Tuscaloosa formation in the northern part of the county and by the Eutaw sands in the more southern areas.

On account of its rough topography only a small percentage of the Orangeburg fine sandy loam is under cultivation. Where it can be cultivated it is a very productive soil and adapted to a great variety of crops. At present cotton and corn are the leading crops. The average yield of cotton is one-fourth to one-third bale per acre. Corn yields 10 to 15 bushels, with an average of 12 bushels. Other crops, such as sweet potatoes, sugar cane, melons, Irish potatoes, and all early vegetables, yield well. Sugar cane produces a sirup of light color and fine quality and brings a much higher price on the market than that grown on the heavier soils. Irish potatoes are grown in some sections on a small scale, yielding from 100 to 150 bushels per acre, with the use of 800 to 1,000 pounds of commercial fertilizer. Oats are grown to a small extent, yielding 15 to 25 bushels per acre.

All of the surface soil of this type is deficient in humus and steps should be taken to change the methods of cropping to remedy this condition. Organic matter can be most cheaply supplied by the

cover and catch crops grown in rotation with the staples. The following crops are well suited for this purpose. Cowpeas, vetch, bur clover, oats, and rye, all of which furnish good forage in addition to increasing the productiveness of the soil. Terracing is practiced to a small extent to prevent washing and should be more extensively used. The regular use of winter cover crops will also prove helpful in controlling erosion. The yields of crops are somewhat larger on the more gently rolling areas. This difference is especially noticeable in the section north and west of Havana.

Most of the type is covered with a native growth of longleaf pine in the northern part and shortleaf pine in the southern part, with a scattering of oak, hickory, gum, black-jack, and scrub oak. Where it has been cut over a heavy growth of scrub oak springs up. Along the ravines and streams an undergrowth of dogwood is found.

The natural grasses afford good grazing for cattle and are utilized by most of the farmers for this purpose. Improved areas are valued according to the character of improvements at \$5 to \$10 an acre. The timbered areas bring from \$4 to \$8 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil:

Mechanical analyses of Orangeburg fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21248, 21250..... | Soil..... | 0.5 | 4.1 | 8.5 | 47.5 | 13.8 | 19.2 | 6.1 |
| 21249, 21251..... | Subsoil..... | .2 | 2.4 | 5.2 | 33.5 | 6.9 | 22.0 | 29.6 |

ORANGEBURG GRAVELLY SANDY LOAM.

The Orangeburg gravelly sandy loam, to a depth of 4 to 8 inches, consists of gray to reddish fine sandy loam containing from 10 to 50 per cent of rounded quartz gravel and a small proportion of angular and irregular shaped cherty fragments. The gravel ranges in size from one-sixteenth to one-half inch in diameter and is usually of a whitish color. The subsoil is a tenacious sandy clay, reddish in color and containing a marked proportion of the same kind of gravel that is found in the overlying soil. In places deposits of gravel occur in sufficient quantities to make a material valuable for road construction, but these areas are not large enough to be mapped separately. The depth of gravel is variable, in some places being only a shallow covering and in others extending to a depth of several feet.

The Orangeburg gravelly sandy loam is located in the northwestern part of the county. The largest areas occur a few miles to the south and southwest of Havana and a few smaller areas north and west of this town. The type commonly is found on steep ridges, knolls, and

hillsides, and is typically developed along the banks of some of the stream courses. Owing to topography and open texture the type has good natural drainage.

The Orangeburg gravelly sandy loam is derived from the weathering of the mantle of sands, sandy clays, and gravel of the Lafayette formation.

Very little of this type is in cultivation, and it is covered for the most part with a scattering growth of shortleaf pine, oak, and hickory. Most of it is too rough and broken for cultivation, though on the occasional more gently rolling areas, where the gravel content is small, cotton may be grown, the yield varying from one-fourth to one-third bale per acre. Corn and oats do not yield very well, and the production of these crops is light on this type. Sweet potatoes and most of the truck crops succeed. Fruit crops, such as peaches and plums, do exceptionally well and they should be grown more extensively.

Coarse manure and commercial fertilizer and the growing of leguminous crops to be plowed under would add greatly to the productivity of this soil.

The Orangeburg gravelly sandy loam ranges in value from \$2 to \$5 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Orangeburg gravelly sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|--------------------|--------------|-----------------|-----------------|-----------------|---------------|--------------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21244, 21246 | Soil..... | 2.6 | 5.1 | 6.1 | 26.8 | 12.6 | 31.4 | 15.2 |
| 21245, 21247 | Subsoil..... | 1.5 | 3.0 | 5.1 | 23.0 | 13.1 | 25.2 | 28.8 |

ORANGEBURG SANDY LOAM.

The soil of the Orangeburg sandy loam consists of a medium sandy loam gray in color to a depth of 6 inches, gradually changing to a grayish-yellow at 15 inches. This material rests upon a red sandy clay subsoil which extends to a depth of 3 feet. The average depth of the surface soil is about 15 inches.

Occasional small areas of the Orangeburg sand occur in this type, but on account of their limited extent they were not shown separately in the map.

Where in cultivation the Orangeburg sandy loam has a light-gray surface soil. The forested areas show a darker gray color, the result of admixture of a greater amount of organic matter in the soil. Below

3 feet the texture and color of the subsoil remains about the same to a depth of 15 feet or more.

The Orangeburg sandy loam occurs in the northeastern part of the county in small areas. The largest area lies north of Phipps. The general topography is broken to hilly, and this together with its sandy nature gives the soil good drainage. Along some of the ridges, especially the steeper, more or less severe erosion has taken place in some places, leaving the subsoil exposed. This erosion is due largely to the absence of organic matter in the soil, its loose incoherent structure and to the lack of terracing.

The Orangeburg sandy loam is derived from the Lafayette formation, which overlies this section. A large percentage of this type is still covered with native forests of longleaf pine and a scattering growth of oak and hickory. Where the timber has been cut off a heavy growth of scrub oak has sprung up. Most of this type is used only for the grazing of cattle, sheep, and goats, and only a small percentage is under cultivation. Cotton and corn are the principal crops. Cotton yields one-fourth to one-third bale to the acre, with the application of 200 pounds of commercial fertilizer. Corn yields 8 to 12 bushels per acre with about the same fertilization.

This soil, on account of its sandy nature, is well adapted to the growing of sweet potatoes, yielding 75 to 150 bushels, with an average of 100 bushels per acre. Sugar cane produces a sirup of fine color and quality. Melons, Irish potatoes, cabbage, onions, and other truck crops all do well.

There is a deficiency of organic matter in the soil, and its productiveness can be markedly increased by growing cowpeas, vetch, and clovers and turning under the stubble or the entire growth. These furnish good forage, and, if not turned under in the green state or pastured, should be fed to the farm stock and the resulting manure saved and returned to the soil. Oats, an excellent crop for winter, is grown to a small extent, yielding 15 to 30 bushels per acre.

Fruit, especially peaches, pears, plums, and figs, find this type of soil congenial. The peaches are of fine color and quality and should be more extensively grown.

Where land of this character is cleared and under cultivation it ranges in value from \$5 to \$7 an acre, according to the improvements and location with regard to towns and shipping points. The forested land is held at \$7 to \$10 an acre, the price depending upon the stand of timber.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Orangeburg sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------------|--------------|--------------|--------------|--------------|------------|-----------------|-----------|-----------|
| | | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 21254, 21256..... | Soil..... | 0.9 | 14.7 | 28.7 | 25.3 | 6.1 | 18.1 | 6.4 |
| 21255, 21257..... | Subsoil..... | .8 | 11.5 | 20.9 | 19.1 | 3.0 | 14.0 | 30.2 |

SUMMARY.

Hale County has an area of 418,560 acres, or 654 square miles. It has three physiographic divisions, differing in topography and soils—the northern part, or hilly section; the southern part, or prairie section; and the Black Warrior River bottoms in the western part.

Greensboro, with a population of approximately 2,500, is the county seat and chief market. The county as a whole is well supplied with transportation facilities.

The climatic conditions are very favorable to general farming and the production of a variety of special crops.

Big Prairie, Little Prairie, Big German, Elliotts, Five Mile, and Big creeks and their tributaries, all flowing into the Black Warrior River, drain the county.

Cotton is the all-important crop and not nearly enough corn and forage crops are produced for local consumption. Alfalfa has been introduced on the Houston clay soil within the last few years and is proving very successful. Lespedeza, Melilotus, Johnson grass, and Bermuda grass grow luxuriantly in the prairie section and a few farmers have begun producing hay from these crops for market and are finding it profitable.

Little dairying is done and very few beef cattle are raised, though no doubt either of these industries would prove profitable on certain soils.

Very few orchards are seen. Trucking is being successfully developed in the western part of the county.

The tenant system largely prevails. Day labor is in general scarce.

The county has a diversity of soils; in all fifteen types were recognized.

The Houston clay, one of the most important of the soils, is especially adapted to forage crops, including alfalfa, and offers good opportunities for stock raising.

The Oktibbeha soils, which occur along with the Houston clay, are also adapted to forage crops and the production of beef cattle.

Of the Black Warrior River bottom soils, the Waverly clay loam has the smallest proportion of cultivable land. It is mainly swamp and where cultivated corn is the only crop grown.

The Cahaba types, occupying the second and third river terraces, respectively, are adapted to a wider range of crops and a greater percentage of them are under cultivation than of the other alluvial soils. Cotton is the principal crop grown on these types.

Of the upland or "sandy land" types, the Orangeburg fine sandy loam and Greenville loam are the most important. The former is especially adapted to fruit growing. The Greenville loam, in addition to being well adapted to general farming, is capable of producing a tobacco of the Cuban filler variety.

There is need in the county of better cultural methods, including deeper and more thorough preparation of the seed bed, shallower cultivation, and systematic rotation of crops.

In developing the agricultural resources of the county, dairying and stock raising should find a place in the southern part, and trucking and fruit growing in the western and northern parts.

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